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ABSTRACT

This paper presents results from a study of the effects on student development of open and traditional family and school environments. The theory is entertained that a match (or congruence) of family and school styles improves some student outcomes, while a mismatch (or incongruence) of environments results in improvement of different student outcomes. Using survey data from 4,079 white students in grades 6, 7, 9 and 12 in 16 secondary schools in Maryland, tests for interaction effects fail to reach accepted levels of significance consistently across grades for any outcome or within grades for multiple outcomes by any family environmental dimension. Instead of interpretable family-school interactions, there are important main effects. Particular family and school conditions have consistently significant, positive consequences throughout adolescence for the seven student outcomes. At all grade levels greater participation in family decisions is associated with more positive personality development and school coping skills; greater participation in classroom decisions are related to more positive school coping skills; and higher family socio-economic status is important for higher aspirations. The study demonstrates the benefits of using specific family and school environmental measures to supplement standard social class variables for better understanding of educational processes. (Author)

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FAMILY AND SCHOOL INTERACTIONS AND MAIN EFFECTS ON AFFECTIVE OUTCOMES

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Abstract

This paper presents results from a study of the effects on student development of "open" and "traditional" family and school environments. The theory is entertained that a match (or congruence) of family and school styles improves some student outcomes, while a mismatch (or incongruence) of environments results in improvement of different student outcomes. Using survey data from 4079 white students in grades 6, 7, 9 and 12 in 16 secondary schools in Maryland, tests for interaction effects fail to reach accepted levels of significance consistently across grades for any outcome or within grades for multiple outcomes by any family environmental dimension.

Instead of interpretable family-school interactions, there are important main effects. Particular family and school conditions have consistently significant, positive consequences throughout adolescence for the seven student outcomes. At all grade levels greater participation in family decisions is associated with more positive personality development and school coping skills; greater participation in classroom decisions are related to more positive school coping skills; and higher family socioeconomic status is important for higher aspirations.

The study demonstrates the benefits of using specific family and school environmental measures to supplement standard social class variables for better understanding of educational processes.

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Introduction

In the 19th century, the practices and goals of the family matched the practices and goals of the schools. For example, the clergy gave sermons reviewing the similar duties of parents and schoolmasters, the aims of education at home and at school, and the means to reach the well-defined goals (Prentice and Houstin, 1975). The prescriptions for education at school and for child-rearing at home were the same; a family-school "match" was inherent in the social-educational system.

Today, the practices and goals of schools and families are divergent. There are a great variety of styles and approaches, so that a congruence of school and family environments cannot be assumed. Schools have begun to diversify their practices to revise the student's role in terms of the amount of authority students share with their teachers, and the amount of student participation in classroom academic decisions. On the one hand, there are still many schools characterized by the stylized environment of seats in rows, chalk and board, teacher in front of the room, assignments collected at the dismissal bell, and lines of students entering now and exiting then. Students in these more traditional schools have limited autonomy; authority remains largely vested in the teacher and school administration (Katz, 1964). At the same time, there are also in operation today schools characterized by moveable desks and chairs, students working in small groups or learning centers, teachers moving about the room to instruct groups or individuals, assignments completed in flexible time frames, and students progressing from one lesson to another or one subject to another or one room to another according to personal choice and individualized schedules. The roles of students and teachers in these schools have

been revised. Students have considerable autonomy for many academic and behavioral decisions that have been typically the responsibility of teachers (Epstein and McPartland, 1975, 1976b).

Similarly, families today differ in style and structure, and in practices, values, and goals. Some families create home environments based on greater child participation in family decisions; other families maintain different child-rearing practices with more parent-control and less child-participation. The natural environmental contrasts of families and schools based on divergent philosophies of education and child-rearing permit and encourage the examination of the effects of congruent and incongruent environments on child development from a sociological perspective.

Psychologists have established several expectations from their studies of trait-treatment interactions (Atkinson, 1974; Bracht, 1970; Hunt, 1971; Mitchell, 1969; Pervin, 1968). They assume that interaction effects will improve our understanding of the learning process and will alter the way we organize and dispense education to individuals. This paper focuses on the potential interaction of two social environments -- the home and the school. The general contention is that different family environments that provide students with contrasting experiences and treatment at home produce youngsters who require different educational environments at school for optimal development of a wide range of student outcomes.

Interaction Typologies

Interest in person-environment interactions to determine optimal conditions for learning for students with different characteristics or needs has influenced many theories and explanations of educators, psychologists and sociologists (Atkinson, 1974; Cronbach and Snow, 1977; Dewey, 1902;

Kohlberg, 1966; Lewin, 1935; Piaget, 1932; Stern, 1961; Torrence, 1965). For some researchers, theories of interaction are based on a match between the individual's current level of ability for a given skill and the new demands within an educational setting for further development of a skill or ability. This is an interaction of person and pace within a single learning sequence or environment (Piaget, 1932; Kohlberg, 1966; Torrence, 1965; Turiel, 1969). Other research concerns the interaction of person and place; that is, multiple or alternative learning environments are designed to match the needs of different personality types or styles of learning (Feldman and Newcomb, 1969; Holland, 1973; Hunt, 1971; Pervin, 1968; Stern, 1970). For example, Stern's (1970) need-press model examines the effect of congruence of the college environment and student personality types on autonomy; Pervin's (1968) classification of individual-environment "fit" attempts to account for performance and satisfaction differences; Holland's (1973) model involves matching type of personality and type of vocational environments for positive effects on vocational satisfaction and achievement; and Feldman and Newcomb's (1969) work on accentuation concerns the effect on behavior and attitudes of matching self-conceptions and type of college or college subsettings.

The distinction between interaction of person with pace or place is an important one. Interactions based on person and pace involve the matching of each individual with a task in a particular learning sequence which leads, in well-defined order, to the mastery of a skill, which in turn, leads to a new skill in an ordered learning hierarchy. Depending on prior learning, different individuals enter the curriculum sequence at different points and move at different rates through a single sequence of tasks and skills. They spend different lengths of time learning or reviewing skills,

but all proceed in a prescribed, increasingly complex sequence of skills. When person and pace are optimally combined, all individuals can ultimately achieve or master the final skill in a learning sequence, barring the development of extreme or abnormal conditions. Interactions based on person and pace are included in the typology of interactions of Snow (1970) and Salomon (1972) as remedial treatments.

Interactions based on person and place involve individuals in contrasting or alternative treatments based on selected measured individual preferences or predispositions and lead either (a) to the same end result of mastery of a skill, but by different educational routes and processes, (compensatory treatments) or (b) to different end results as individual talents and unique skills are matched with contrasting conditions of education (preferential treatments).

In practice, the dynamics of growth may be directed by both pace and place. A "match" of preferred learning and teaching styles at one time may be a "mismatch" at a later time if new skills are developed or required. For example, students working in math who usually learn independently with little supervision may require a short period of traditional instruction and close supervision for a few lessons when a difficult, new concept is being introduced. Or, students may change pace as they proceed with learning. For example, students who typically move speedily through a learning sequence may require slow, remedial assistance to learn and review a particular skill in the sequence, and then revert to their more typical pace for many weeks or months thereafter. Hunt (1971) has attempted to formulate a complex theory that incorporates a prescribed level of disequilibrium or challenge into a preferential treatment model (see also Atkinson, Lens, and O'Malley, 1976).

In spite of the interest in interactions and the useful distinctions between types that may operate, few interaction effects have been documented or replicated in rigorous research (Berliner and Cahen, 1973; Salomon, 1972; Feldman and Weiler, 1976). Indeed, research is in its infancy in the development of theories and evidence of environmental interactions (Spady, 1973).

In this paper we are examining closely the potential of environment-environment interactions--an extension of the more familiar trait-treatment (preferential) model. Specifically, this research considers the juxtaposition of learning styles developed in two environments--home and school. We assume that the influential environment a person experiences at home may produce a preferred style for learning which could be coordinated with the school environment to optimize motivation and learning. In particular, students from families that provide many opportunities for child participation in decision-making at home may make greater progress in classrooms where the students partake in important academic decisions; and students from families that provide few opportunities for child participation in family decisions may progress best in classrooms where the teachers have total responsibility for important academic decisions. We would expect that a positive effect of a match or congruence of <u>home</u> and <u>school</u> environments should be noted for some student outcomes, particularly those where comfort and familiarity with an environment is an important determinant of the outcome. On the other hand, for other types of student outcomes, it may be the case that a <u>mismatch</u>, or <u>incongruence</u> of home and school styles promotes greater growth because of the challenge and stimulation that is encountered. If no interaction between environments is evident, we must consider whether particular school environmental conditions optimize student development on several outcomes regardless of family experiences.

Research designed to examine the links between school and family environment has been limited, ambiguous and unreplicated (Minuchin, 1969; Slaughter, 1977; Solomon and Kendall, 1975; Ward and Barcher, 1975). However, many social scientists and educators maintain that studies to identify powerful interactions can significantly add to our understanding of the total process of education. The need for systematic research on family and school interactions has frequently been expressed (Bidwell, 1972; Boocock, 1972; Clausen, 1968; Leichter, 1974; Slaughter, 1977). The study described in the next section attempts to fill some of the gaps noted in earlier studies. It utilizes similar concepts and measurement of the family and school variables to consider the effects of interaction of family and school environments for a diverse set of affective outcomes.[1/]

The Sample and Measures

The sample for this study is 4079 white students from grades 6, 7, 9 and 12 in ten middle schools and six high schools in a Maryland district. The district was selected because it is one of the few in the nation that had developed significantly different school environments at the secondary level. At each grade level, there are schools with "open" instructional programs and other schools with "traditional" programs (Epstein and McPartland, 1975). The student population also provides significant variation within schools in family characteristics, both in social class and in family authority systems (McPartland and Epstein, 1976).

The independent variables.

Three measures of the family environment are key independent variables.

[1/] Consideration of academic outcomes--standardized achievement test scores--is found in McPartland and Epstein, 1977.

Two measures assess the family authority-control system: Family decision-making style concerns the nature of communication-control between parents and child, and the degree of participation by the child in family decisions; level of regulation concerns the extent to which rules control the child's activities at home. The third family environment measure is socioeconomic status and includes parents' education, material possessions, and family size.

Two aspects of the school environment are featured. First, openness of the instructional program, is a continuous aggregate measure of the degree of student choice, individualization, and physical freedom in the classroom. The second measure, classroom decision-making style, is a measure of the degree of participation by the child in classroom decisions. The scale is parallel in construction and content to the family decision-making scale, but focuses on teachers rather than parents as authority figures with whom the child communicates and shares responsibilities.

Other individual background variables used in selected analyses include sex of student, student intelligence (verbal IQ), and report card grades in English and math. The independent variables are described in Appendix A.[1/]

The family and school environmental measures are based on the reported behavioral practices or physical characteristics of the two settings. It is generally believed that person-environment interaction studies require measurement of the person and environment in comparable form (Clausen, 1968; Holland, 1973; Hunt, 1971; Stern, 1970). In this study, the family and classroom decision-making style scales are directly parallel. In

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[1/] The reliability of all independent variables are presented along with analyses that support the validity of the measures in Epstein and McPartland, 1975, McPartland and Epstein, 1976, and Epstein and McPartland, forthcoming.

addition, openness of the family and openness of the school program represent common underlying constructs for tests of family-school interactions.

Table 1 summarizes student responses on measures of family and school environments. On four of the measures--family decision-making style, level of regulation, openness of school program, and classroom decision-making--there is clear evidence of a developmental trend for older students toward more responsibility and participation in decisions.

The dependent variables.

Three types of outcome variables entail seven measures of student behaviors.[1/] Details of the seven measures are reported in Appendix A.

Personality:

1. Self-reliance is an 18-item scale of student ability to operate independent of adult direction or peer support.

2. Self-esteem is a 4-item self evaluation of personal worth and ability.

3. Control of environment is a 9-item scale that concerns the degree to which a student feels control over actions and events in the environment.

[1/] Researchers increasingly cite the importance of the study of affective measures as objectives of schooling in addition to achievement (Averch, 1972; Bloom, 1976; Jencks, 1972). Affective outcomes may be particularly important to include in studies of open and traditional schools and families because of the assumptions that experience in contrasting authority-control settings result in the development of different skills and talents, apart from standardized achievement (Barth, 1972; Minuchin, 1969; Piaget and Infelder, 1969; Rathbone, 1971; Weber, 1971). Affective and achievement measures are compared for males and females in a separate paper (Epstein and McPartland, 1977).

School Coping Skills:

4. Perceived quality of school life is a 5-item scale that measures student satisfaction with school, classwork, and student-teacher relations.

5. Prosocial (school-task) behavior is a 6-item scale which requires students to report their behavioral reactions to work-related demands characteristic of the school setting.

6. Disciplinary adjustment is a 9-item scale that concerns the extent to which students are involved in actions in class requiring the teacher to admonish or punish them.

Goal Orientation

7. College plans is a single-item indicator of expected directions for education in the future.

Table 2 presents the mean scores and t-tests by family environmental subgroups for the seven measures. While several interesting patterns appear in the unadjusted mean scores to suggest influence of family conditions on student outcomes, these will be examined in detail in the section of this paper on main effects. At this point it may be noted that among the personality measures, average self-reliance scores show a clear developmental trend, while scores in self-esteem and control of environment show small and less consistent developmental increases. On school coping skills, students become less positive in their evaluation of school experiences and less responsible about their school-task behavior. No definite trend is noted on disciplinary adjustment, except the oldest students who remain in school through grade 12 are best adjusted (i.e., subjected to the fewest disciplinary incidents). College plans show small decreases from sixth through ninth grade, and then increase for twelfth graders, as the time for action on decisions approaches.

Table 1

Means and standard deviations for family and school environmental measures, by grade.

Environmental context		Grades 6	7	9	12
Family Environment					
1. Family decision-making (Scored high=more child participation)	$\bar{x}$	6.45	6.68	6.70	7.73
	s.d.	(2.13)	(2.28)	(2.55)	(2.55)
2. Level of regulation (Scored high=less restrictive)	$\bar{x}$	7.61	8.12	8.58	10.20
	s.d.	(2.75)	(2.81)	(2.75)	(2.62)
3. Socio-economic status					
a. Parents' education (Years of school completed by mother and father)	$\bar{x}$	27.66	27.20	26.88	26.44
	s.d.	(4.74)	(4.90)	(4.78)	(4.58)
b. Material possessions	$\bar{x}$	17.43	17.63	17.98	18.15
	s.d.	(3.25)	(3.29)	(3.21)	(2.95)
c. Family size	$\bar{x}$	2.44	2.63	2.69	2.63
	s.d.	(1.52)	(1.71)	(1.67)	(1.70)
School Environment					
1. Openness of the instructional program (scored high=more open)	$\bar{x}$	62.86	64.99	77.61	80.03
	s.d.	(20.50)	(16.86)	(31.95)	(31.03)
2. Classroom decision-making style (scored high=more child participation)	$\bar{x}$	5.00	5.19	5.70	6.71
	s.d.	(2.06)	(2.17)	(2.17)	(2.21)
Sample Size		1156	1021	109[illegible]	737

The Tests for Interactions

One major question of this research is whether there exist interpretable interaction effects of school and family environments when we use parallel environmental measures (i.e. family decision-making style and classroom decision-making style) or when we use constructs that are similar (openness of school program and openness of the family). To address the question of family-school environment interactions, the test for homogeneity of group regressions was performed to determine whether the regression equations are the same for the contrasting family environment subgroups (Kerlinger and Pedhazur, 1973; Tatsuoka, 1971).

These tests help to determine whether there is a single, advantageous social influence process for particular student outcomes or whether students with different family experiences are differently affected by their individual and school characteristics. An interaction of family experiences with at least one other variable is suggested if the multiple (group) regression equations conducted separately for each family subgroup account for significantly more of the explained variation of the student outcomes than a single (common) model. In other words, if the null hypothesis for homogeneity is rejected, we would have evidence of a significant interaction between the family environment and at least one other family, school, or individual background variable. It would then be possible to determine if the significant effect was due to a family-school variable interaction where the effect of a school variable on a student outcome would be different for students from contrasting family groups. However, if the amount of variance explained is <u>not</u> significantly greater with the use of multiple equations, it may be that one family treatment is consistently more advantageous for

Table 2
FAMILY

Mean scores, t-test, and significance of family variable for seven student outcomes by subgroup of family decision-making style, level of regulation at home, and parents' education, by grade.

Outcome and Grade Level[a]		Participation in Family Decisions			Level of Regulation			Parents' Education		
		High	Low	t-test[b]	Low	High	t-test[b]	High	Low	t-test[b]
Personality measures:										
1. Self-reliance	6	10.36	8.85	9.44*[c]	9.86	9.34	2.99[c]	9.85	9.33	2.96[c]
	7	10.98	9.38	8.92*	10.63	9.94	3.68	10.78	9.73	5.67*
	9	11.65	10.31	7.32*	11.30	10.80	2.69	11.78	10.40	7.45*
	12	12.73	11.50	5.32*	12.62	11.89	3.14	12.77	11.82	4.12
2. Self-Esteem	6	3.13	2.75	4.56*	3.00	2.88	1.50	3.07	2.82	3.02
	7	3.14	2.91	2.85*	3.08	3.00	1.08	3.13	2.93	2.42
	9	3.16	2.82	4.24*	3.03	3.00	0.31	3.21	2.84	4.67
	12	3.38	3.04	3.63*	3.27	3.19	0.90	3.37	3.13	2.14
3. Control of Environment	6	6.53	5.77	6.20*	6.23	6.09	1.15*(-)	6.36	5.94	3.30
	7	6.68	5.77	6.84*	6.38	6.17	1.61	6.56	5.92	4.74
	9	6.84	5.72	8.56*	6.44	6.31	0.92*(-)	6.65	6.11	3.93
	12	6.95	6.14	5.25*	6.76	6.52	1.55	6.70	6.59	0.74
School Coping Skills:										
4. Quality of School Life (short scale)	6	2.42	1.74	7.30*	1.97	2.23	-2.75*	2.13	2.08	0.54
	7	2.04	1.59	4.60*	1.69	2.00	-3.06*	1.94	1.73	2.09
	9	1.86	1.40	5.18*	1.57	1.75	-2.00*	1.84	1.52	3.50
	12	1.52	1.24	2.54*	1.38	1.43	-0.43*	1.49	1.38	1.02
5. Prosocial Behavior (scored neg.)	6	1.13	1.85	-8.38*	1.52	1.43	1.03*	1.40	1.56	-1.60
	7	1.49	2.07	-6.11*	1.79	1.71	0.75*	1.65	1.86	-2.09
	9	1.81	2.50	-7.76*	2.10	2.14	0.40	2.02	2.20	-1.90
	12	1.92	2.51	-5.28*	2.13	2.18	0.54	2.12	2.20	-0.61

continued

Table 2 Continued
FAMILY

Outcome and Grade level[a]		Family Style: High	Family Style: Low	Family Style: t-test[b]	Level of Regulation: Low	Level of Regulation: High	Level of Regulation: t-test[b]	Parents' Education: High	Parents' Education: Low	Parents' Education: t-test[b]
6. Disciplinary Adjustment	6	22.83	21.40	3.69*[c]	22.10	22.16	-0.15*[c]	22.00	22.40	-1.02[c]
	7	22.05	20.93	2.81*	21.18	21.97	-1.97*	21.63	21.56	0.16
	9	22.22	20.46	4.62*	21.05	21.85	-2.07*	22.35	20.66	4.49*
	12	23.24	22.20	2.71	22.54	22.94	-1.06	22.81	22.71	0.27
Goal Orientation:										
7. College Plans	6	.52	.48	1.28	.50	.50	-0.09	.62	.35	9.26*
	7	.48	.41	2.12	.44	.45	-0.38	.61	.28	11.12*
	9	.51	.35	5.37*	.45	.42	0.83*(-)	.61	.28	11.72*
	12	.58	.44	3.75	.52	.52	0.24*(-)	.72	.37	9.87*

[a] Representative sample sizes for outcomes 1, 4, 5, 7 are: Grade 6, 1149; Grade 7, 1016; Grade 9, 1109; and Grade 12, 738. Random samples of students were administered scales for outcomes 2, 3, 6, 8 as follows: Grade 6, 767; Grade 7, 683; Grade 9, 737; and Grade 12, 488.

[b] t-test values of 1.96 or greater are significant at the .05 level.

[c] Asterisk * indicates that the family variable is a significant regression coefficient in multiple regression analyses (not reported here) when all other family, background, and school variables are controlled. Sign in parentheses shows direction of beta when significant.

student outcomes. This is the possibility of significant main effects; tests for main effects are described in a later section of this paper.

The tests for interactions were conducted separately for the three family environment dimensions.[1/] Tables 3A, 3B, and 3C present the tests of homogeneity of group regressions for subgroups of family decision-making style, level of regulation, and parents' education. The tables first show the percent of variance explained when the group regression (multiple) model is employed in which separate regression equations were used for contrasting family groups. The next column presents the explained variance under a single, common model (using only one regression equation in which the family environmental measure is included as a dichotomous, independent variable) along with the nine variables included in the model. The tables also report the percent R^2 increase of the multiple model over the common model. Finally, the tables provide the F-statistics for the tests of homogeneity of group regressions, and (for ease of comparison of results) the F-statistics for the tests of main effects of each family-environment variable on the selected outcomes.

Tables 3A, 3B, and 3C show clearly that there are very few significant interactions. Of the eighty four tests conducted, only 15 were significant; of the 21 tests conducted at each grade level, 4 reached a standard level

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[1/] For these tests of interaction family environment measures are treated dichotomously, representing authoritarian and democratic conditions at home. In other work where the range of variation of scores and patterns of scores suggest it appropriate, family environmental conditions are conceptualized and treated as a trichotomy--covering authoritarian, democratic, and permissive conditions (see Baumrind, 1966, 1970, Becker, 1964, and Elder, 1971 for a discussion of these dimensions). Curvilinearity associated with measures of family decision-making or level of regulation at home was not apparent in these data.

of significance in grade 6; 3 in grade 9; and 5 in grade 12. While these numbers are greater than would be expected by chance, the patterns are not consistent or interpretable. For example, in grades 6 and 9 interactions are significant for self-reliance with different family environmental measures, but the patterns are not evident in grades 7 and 12. In grades 9 and 12 self-esteem is the dependent measure for which significant interactions appear, but not in grades 6 and 7.

For purposes of theoretical exploration the significant interactions were examined to discover if the school variables were creating the evidence of interactions. Product terms for each family-by-school variable combination were added to the regression equation separately for analysis (Kerlinger and Pedhazur, 1973). Openness of the school program and participation in classroom decisions were each used to form product terms with parents' education, family decision-making style, and level of regulation for a total of six family-by-school product terms as potential contributors to the set of significant interactions. In addition school-by-school and family-by-family variable combinations were also examined. Of the fifteen tests conducted eight tests of significance are due at least in part to family-school interactions, but every possible combination of family and school variables is represented; seven are due to family-family combinations with every possible combination of the measures; four are due to neither family-school, family-family, nor school-school variable combinations. No interpretable patterns by grade or outcome are evident among the fifteen tests.

It is clear that there is no consistency across grades by outcome, across grades by cluster, within grade by family environment subgroup across outcome, or by any other explicit pattern. In addition to the absence of

Table 3A

Tests for interaction of Family Decision-making Style with other family, school or individual characteristics, and main effects for seven student outcomes, by grade.

Outcome and Grade		% of Variance Explained by 1 Multiple model [a]	2 Common model [b]	3 % increase (Col 1-2)	Associated F-statistic 4 Interactions [c]	5 Main effect [d]
1. Self-reliance	6	21.60	20.23	1.37	2.19	49.86
	7	19.17	18.32	0.85	1.17	47.26
	9	18.86	18.21	0.65	0.96	20.91
	12	19.72	19.17	0.55	0.55	7.64
2. Self-esteem	6	14.27	13.87	0.40	0.38	12.88
	7	11.30	10.55	0.75	0.63	6.08
	9	20.84	18.05	2.79	2.81	5.84
	12	15.74	10.64	5.10	3.15	5.06
3. Control of Environment	6	23.02	21.54	1.48	1.60	22.04
	7	22.40	19.44	2.96	2.81	34.72
	9	21.96	20.80	1.16	1.18	45.88
	12	15.68	12.82	2.86	1.76	12.12
4. Quality of School life	6	18.02	17.02	1.00	1.54	39.18
	7	13.44	12.64	0.80	1.03	18.92
	9	12.86	12.17	0.69	0.96	16.10
	12	12.53	11.22	1.31	1.20	3.92
5. Prosocial Behavior	6	15.31	14.00	1.31	1.03	48.15
	7	17.86	17.05	0.81	1.09	22.96
	9	12.67	11.41	1.26	1.75	40.22
	12	11.39	10.19	1.20	1.08	19.73

Continued

Table 3A Continued

Outcome and Grade		% of Variance Explained by: 1 Multiple model [a]	2 Common model [b]	3 % increase (Col 1-2)	Associated F-statistic: 4 Interactions [c]	5 Main effect [d]
6. Disciplinary Adjustment	6	17.54	15.43	2.11	2.12	9.82
	7	19.53	17.68	1.85	1.69	5.70
	9	17.81	16.74	1.07	1.04	14.11
	12	17.34	13.91	3.43	2.16	1.71
7. College Plans	6	12.85	12.51	0.34	0.48	0.13
	7	18.43	17.12	1.31	1.79	0.84
	9	27.40	26.72	0.68	1.14	10.93
	12	35.34	34.52	0.82	1.02	2.88

[a] Independent variables include: sex, parents' education, material possessions, family size, child's verbal ability, level of family regulation, openness of school program, classroom decision-making style, and report card grades.

[b] To the independent variables in (a) is added family decision-making style.

[c] Level of significance: 1.89=.05 level; 2.43=.01 level.

[d] Level of significance: 3.85=.05 level; 6.66=.01 level.

Table 3B

Test for interaction of Level of Regulation at home with other family, school or individual characteristics, and main effects for seven student outcomes, by grade.

Outcome and Grade		% of Variance Explained by 1 Multiple model [a]	2 Common model [b]	3 % increase (Col 1-2)	Associated F-statistic 4 Interactions [c]	5 Main effect [d]
1. Self-reliance	6	23.36	22.57	0.79	1.28	0.22
	7	21.71	20.85	0.86	1.20	0.88
	9	20.97	18.92	2.05	3.11	0.21
	12	21.45	19.91	1.54	1.57	0.03
2. Self-esteem	6	16.92	15.35	1.57	1.57	0.54
	7	10.79	10.34	0.45	0.36	0.02
	9	22.35	19.28	3.07	3.12	4.40
	12	13.20	11.88	1.32	0.80	2.09
3. Control of Environment	6	25.97	24.43	1.54	1.73	4.41
	7	21.03	20.43	0.60	0.55	0.68
	9	22.43	21.70	0.73	0.75	5.62
	12	19.39	16.45	2.94	1.90	1.43
4. Quality of School Life	6	16.93	16.08	0.85	1.29	32.51
	7	13.02	12.09	0.93	1.17	25.14
	9	13.20	12.45	0.75	1.04	14.77
	12	13.38	11.05	2.33	2.15	2.34
5. Prosocial Behavior	6	16.04	15.32	0.72	1.07	16.73
	7	19.59	18.94	0.65	0.88	12.56
	9	14.44	13.21	1.23	1.71	4.21
	12	12.41	11.51	0.90	0.82	1.57

Continued

Table 3B Continued

Outcome and Grade		% of Variance Explained by: 1 Multiple model [a]	2 Common model [b]	3 % increase (Col 1-2)	Associated F-statistic: 4 Interactions [c]	5 Main effect [d]
6. Disciplinary Adjustment	6	17.95	15.94	2.01	2.03	1.85
	7	20.46	18.16	2.30	2.10	17.39
	9	17.88	17.33	0.55	0.53	14.64
	12	17.10	14.43	2.67	1.68	3.33
7. College Plans	6	12.90	12.14	0.76	1.08	2.38
	7	18.34	16.99	1.35	1.45	2.30
	9	27.09	26.96	0.13	0.22	2.06
	12	34.60	34.08	0.52	0.64	8.67

[a] Independent variables include: sex, parents' education, material possessions, family size, child's verbal ability, family decision-making style, openness of school program, classroom decision-making style, and report card grades.

[b] To the independent variables in (a) is added level of family regulation.

[c] Level of significance: 1.89=.05 level; 2.43=.01 level.

[d] Level of significance: 3.85=.05 level; 6.66=.01 level.

Table 3C

Test for interaction of Family Social Class with other family, school or individual characteristics and main effects for seven student outcomes, by grade.

Outcome and Grade		% of Variance Explained by: 1 Multiple model [a]	2 Common model [b]	3 % increase in (Col 1-2)	Associated F-statistic: 4 Interactions [c]	5 Main effect [d]
1. Self-reliance	6	23.79	22.17	1.62	2.68	2.01
	7	21.90	21.30	0.60	0.86	4.10
	9	18.21	17.90	0.31	0.46	6.17
	12	20.96	20.00	0.96	0.97	2.30
2. Self-esteem	6	15.98	14.72	1.26	1.25	2.90
	7	11.42	11.04	0.38	0.32	2.10
	9	20.25	18.38	1.87	1.85	1.53
	12	16.12	12.03	4.09	2.55	0.67
3. Control of Environment	6	25.31	24.30	1.01	1.13	2.36
	7	21.02	20.34	0.68	0.64	2.84
	9	22.63	22.03	0.60	0.61	2.51
	12	18.35	16.62	1.73	1.11	1.26
4. Quality of School Life	6	18.17	17.55	0.62	0.95	0.32
	7	14.42	13.55	0.87	1.13	1.28
	9	13.04	12.67	0.37	0.51	0.25
	12	12.48	12.08	0.40	0.36	2.80
5. Prosocial Behavior	6	16.21	15.43	0.78	1.17	0.72
	7	21.31	19.77	1.54	2.18	1.85
	9	14.05	12.80	1.97	1.73	0.87
	12	13.01	11.87	1.14	1.04	1.59

Continued.

Table 3C Continued

Outcome and Grade		% of Variance Explained by: 1 Multiple model [a]	2 Common model [b]	3 % increase (Col 1-2)	Associated F-statistic: 4 Interactions [c]	5 Main effect [d]
6. Disciplinary Adjustment	6	17.08	16.15	0.93	0.94	1.78
	7	20.31	18.94	1.37	1.27	0.98
	9	18.41	17.57	0.84	0.81	2.18
	12	15.01	14.03	0.98	0.61	0.03
7. College Plans	6	12.62	12.14	0.48	0.69	23.14
	7	18.15	17.72	0.43	0.58	22.37
	9	28.36	26.47	1.89	3.16	35.00
	12	35.70	34.91	0.79	0.99	37.56

[a] Independent variables include: sex, material possessions, family size, child's verbal ability, family decision-making style, level of family regulation, openness of school program, classroom decision-making style, and report card grades.

[b] To the independent variables in (a) is added parents' education.

[c] Level of significance: 1.89=.05 level; 2.43=.01 level.

[d] Level of significance: 3.85=.01 level; 6.66=.05 level.

consistent patterns of significant interactions, the increase in the percent of variance explained due to the multiple model is very small--less than four percent in all but two instances, and usually less than two percent. We do not greatly increase our understanding of the process of development using a multiple model over a common model that accounts for students' family subgroup membership.

Study of Main Effects

A. Differences in Mean Scores of Family Environment Subgroups

As the standard follow-up of insignificant or inconclusive interaction effects, tests of main effects were conducted to consider differences in subgroup intercepts. These tests indicate whether the mean scores of two groups are significantly different, net of other independent variables in the model. Column 5 on tables 3A, 3B and 3C reports the F-statistic associated with the test for main effects for each family environment dimension on the seven student outcomes. The F-test is based on the increase in explained variance due to the addition to the model of the family environmental variable (Kerlinger and Pedhazur, 1973).

On Table 3A there are, across grade levels, very consistent, significant main effects of the family decision-making style variable for all outcomes except college plans. In other words, the differences in mean scores of low and high family style subgroups are significant, after controlling on all other family, school and individual characteristics. Here, students from families high in child participation in decision-making at home have significantly higher scores on self-reliance, self-esteem, control of

environment, perceived quality of school life, school-task behavior, and disciplinary adjustment; but no difference is noted for college plans.

Table 3B shows less dramatic main effects for level of regulation (family rules), but one interesting pattern should be noted. Using Table 2 as a reference for tests of significance of differences in mean scores, we see that when level of regulation at home is significant, (e.g. for students' perceived quality of school life, school-task behavior and disciplinary adjustment) it is the students with less regulation at home who are less positive toward school, less likely to fulfill school-task demands, and less well adjusted. The same pattern is true when level of regulation shows a significant main effect for control of environment and college plans. This pattern appears contrary to the pattern of relationships associated with the main effects reported as significant in Table 3A. Using Table 2 again as a reference, it is clear that children from families that offer more participation in decision-making are more positive on the same outcomes. It appears that the communication-control aspect of the family-authority system (measured by family decision-making style) is separate and quite different in effect from the regulation-control aspect at home (measured by number of rules). The most positive effects for school coping skills are related to greater shared decision-making and relatively high regulation at home.

Table 3C reports dramatic main effects in every grade of parents' education on only one variable--college plans. College plans are not much influenced by family decision-making style or level of regulation, and the other outcome variables are not much influenced by social class. As expected, it is, on the average, the students whose parents have higher education who aspire to higher education themselves.

The contrasts of Tables 3A, 3B and 3C demonstrate the benefit of representing the family environment by measures in addition to social class. This is especially true when many types of student outcomes are being researched. Certain aspects of the family environment are important for some outcomes and not others. Social class, in particular, may not be the most important aspect of the family environment for understanding the nature of family influence on affective behavior.

B. Relative Influence of Family, School, and Individual Characteristics

Table 4 presents the partitioning of explained variance among 4 clusters of variables to clarify the relative influence of family, school and individual characteristics.

1. STATUS--Socioeconomic status (includes parents' education, material possessions, and family size);

2. FAM--Family authority system (includes family decision-making style and level of regulation;

3. SCH--School environment (includes openness of instructional program and classroom decision-making style);

4. INDV--Individual characteristics and ability (includes sex of student, verbal IQ, and report card grades).

The four clusters are composed of variables that differ in the degree to which conditions represented are manipulable. Thus, STATUS and INDV (family social class and individual abilities) are relatively difficult to manipulate, but FAM and SCH (both organizational and procedural conditions) may be more amenable to social change.

The unique contribution (UNIQ) is the portion of variance for a given outcome that is only associated with a particular cluster of variables in

model. The larger the unique contribution, the more definite the importance of the variable cluster to the model. The joint contribution (JOINT) is the sum of explained variation the variable cluster shares with other variable clusters. These commonalities reflect intercorrelation among sets or groups of variables in the model (Mood, 1971; Kerlinger and Pedhazur, 1973). On Table 4, the JOINT contributions, summed for each variable cluster, are not mutually exclusive. Therefore the total percent of variance is not the sum of unique and these joint contributions.

Table 4 summarizes the results of the commonality analysis. Two contrasts are of interest: (1) Columns 1-4 highlight the relative importance of the unique contributions of the four clusters within a grade for the seven outcomes and the consistency of these patterns across the grades; and (2) Column 10 shows the maximum percent of variance attributable to the manipulable school and family environmental variable clusters. Reading across columns 1-4 there are several clear contrasts of the importance of the unique contributions of clusters for each outcome; and reading down columns 1-4, differences may be noted in the outcomes most influenced by each cluster:

1. UNIQ STATUS and COLLEGE PLANS

In every grade, UNIQ STATUS (family socioeconomic status) accounts for a sizeable portion of variance for college plans but not for any other outcome; and UNIQ STATUS contributes more to the explained variance of college plans than does any other cluster of variables.

2. UNIQ FAM and ALL OUTCOMES EXCEPT COLLEGE PLANS

UNIQ FAM (family authority system variables) is consistently important at all grade levels for all variables except college plans.

3. UNIQ SCH and SCHOOL COPING SKILLS

UNIQ SCH (school environment variables) makes small but significant contributions only to the measures of school coping skills (perceived quality of school experiences, school-task behavior, and disciplinary adjustment).[1/] Schools can influence student behavior, especially school related attitudes and behaviors, and the influence of school experiences increases as students are individually affected by their treatment within the school environment. It is important to note that family (FAM) and individual (INDV) contributions are always as large or larger than those of the school (SCH), but the school cluster is always more influential than the STATUS variables for school coping skills. The school coping skills are measureably affected by all clusters of variables except social class (STATUS).

4. UNIQ INDV ALL OUTCOMES

UNIQ INDV (personal characteristics and abilities, including sex, verbal ability, and success in school) is a cluster of variables that contributes significantly to the explained variance of <u>all</u> of the student outcomes. This may be due to the fact that verbal ability and success in school are, in part, outcomes of school and family experiences as well as inputs that affect individual behavior. The cluster of individual characteristics and abilities is included here not for the clarity of explanation it provides about individuals, but to permit more focused

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[1/] In analyses not reported here, the two variables in the school environment cluster were aggregated at the school level. As would be expected, the contribution to variance of individual level outcomes decreased, but the pattern remained the same: UNIQ SCH contributions to school coping skills were small but significant; UNIQ SCH did not affect other outcomes of personality or college plans.

Table 4

Percent of variance accounted for by Socioeconomic Status (STATUS), Family Authority System (FAM), School Environment (SCH), Individual Characteristics (INDV) for seven outcomes by grade.

Grade and Outcome	1 UNIQ STATUS	2 UNIQ FAM	3 UNIQ SCH[b]	4 UNIO INDV	5 JOINT WITH STATUS	6 JOINT WITH FAM	7 JOINT WITH SCH	8 JOINT WITH INDV	9 TOT % VAR EXPL[a]	10 MAXIMUM % due to FAM & SCH
Grade 6										
1. Self-reliance	0.43	6.25	3.06	4.90	1.74	5.78	5.76	5.24	22.61	16.36
2. Self-esteem	1.35	2.45	0.06	6.29	2.86	2.31	1.58	4.28	14.85	5.30
3. Control of environment	0.99	5.22	1.18	9.14	2.54	4.79	4.53	6.57	24.46	12.74
4. Quality of school life	0.09	5.19	3.53	3.65	0.28	2.62	4.37	3.33	17.25	13.33
5. Prosocial behavior	0.24	5.53	3.00	1.92	0.37	3.51	3.87	2.80	15.44	13.06
6. Adjustment to school	0.90	2.39	4.08	5.14	0.34	2.16	3.42	2.33	16.46	10.37
7. College plans	5.86	0.23	0.22	2.21	4.16	0.19	0.95	3.38	12.60	1.53
Grade 7										
1. Self-reliance	0.74	6.62	0.77	4.43	4.06	4.01	4.58	6.64	20.64	12.96
2. Self-esteem	0.78	1.07	0.56	4.16	3.33	0.70	1.47	4.03	10.79	3.04
3. Control of environment	0.90	5.26	1.01	5.99	4.23	2.87	3.80	6.30	20.48	10.36
4. Quality of school life	0.20	4.45	2.43	2.86	0.21	1.55	3.05	2.10	13.11	10.04
5. Prosocial behavior	0.60	5.27	4.05	3.84	0.47	3.52	5.52	3.93	19.75	15.21
6. Adjustment to school	0.30	3.79	5.84	5.46	0.05	1.44	3.27	2.32	18.79	12.92
7. College plans	4.87	0.29	0.70	2.96	7.45	0.34	3.88	7.24	17.13	4.84

(continued)

Table 4 continued

Percent of variance accounted for by Socioeconomic Status (STATUS), Family Authority System (FAM), School Environment (SCH), Individual Characteristics (INDV) for seven outcomes by grade.

Grade and Outcome	1 UNIQ STATUS	2 UNIQ FAM	3 UNIQ SCH b/	4 UNIQ INDV	5 JOINT WITH STATUS	6 JOINT WITH FAM	7 JOINT WITH SCH b/	8 JOINT WITH INDV	9 TOT % VAR EXPL a/	10 MAXIMUM % due to FAM & SCH
Grade 9										
1. Self-reliance	1.94	2.59	1.03	3.50	7.06	3.47	4.69	8.35	18.77	9.72
2. Self-esteem	0.75	1.44	0.18	9.78	4.63	2.75	2.53	6.36	18.79	5.75
3. Control of environment	0.79	6.63	0.78	5.62	3.76	5.65	4.22	7.35	22.42	14.29
4. Quality of school life	0.14	2.54	2.23	2.54	1.98	2.60	4.33	4.34	12.88	9.83
5. Prosocial behavior	0.32	5.17	1.33	2.22	0.90	2.94	3.45	3.06	13.33	10.67
6. Adjustment to school	0.78	3.84	2.63	3.74	2.61	3.88	4.73	5.78	17.90	12.34
7. College plans	7.48	0.92	0.38	6.19	10.91	2.43	2.16	11.88	26.84	4.93
Grade 12										
1. Self-reliance	0.89	2.08	0.35	9.00	4.41	3.40	1.97	7.09	19.88	6.90
2. Self-esteem	0.12	2.81	0.15	4.39	1.59	2.72	1.61	4.05	11.89	6.30
3. Control of environment	0.52	5.88	0.48	3.71	0.95	4.06	2.75	4.26	15.94	11.12
4. Quality of school life	0.55	1.70	4.76	1.52	0.25	1.31	3.25	2.26	11.87	9.80
5. Prosocial behavior	0.49	3.78	2.43	1.62	0.35	1.87	2.76	1.61	11.41	9.05
6. Adjustment to school	0.24	0.64	4.99	4.35	-0.16	2.08	3.86	2.32	14.03	9.63
7. College plans	9.90	1.33	0.63	10.71	10.47	1.14	2.80	11.85	34.93	5.07

a/ Total percent does not add to sum of unique and joint contributions because the JOINT categories include redundant combinations of variables.

b/ Analyses show that the contribution of SCH is due mainly to the interpersonal student-teacher process and less to the structure of the school program. (Also see Epstein and McPartland, forthcoming.)

consideration of the contribution of the family and school clusters unconfounded by individual characteristics.

The last column of Table 4 (column 10) shows the maximum percent of explained variance attributable to the school environment (SCH) and the family environment (FAM) clusters of variables. The percent of the total explained variance attributable in full or in part to school and family environmental qualities is sizeable for all outcomes at all grade levels with the exception of college plans. These percentages are underestimated to the extent that verbal ability and report card grades are functions of school and family environments. The percentages are overestimated to the extent that portions of joint variances are not attributable to school or family environments, but rather solely to the STATUS or INDIV variables. Nevertheless, the percentages are not far off the mark, and suggest the very substantial potential influence of the manipulable environmental variables as characterized in this study--i.e. as authority-control structures at home and at school--on student behavior.

C. Proportion of Influence of Family, School, and Individual Characteristics

We should also examine the proportion of explained variance of each unique cluster to determine whether the relative influence of a particular cluster changes markedly over the adolescent years for particular outcomes. It is generally believed that the influence of the family decreases as students complete adolescence, and that other contacts (e.g. the school and/or peer group) increase in influence. Research on this issue has typically focused on the influence of parents, teachers, and/or peers on college plans (Kandel and Lesser, 1969; Picou and Carter, 1976).

This study provides an opportunity to examine whether the influence of the family environment changes when compared to the influence of family status, school environment, and individual ability variables for several student outcomes, including but not limited to college plans.

Table 5 shows for each outcome the proportion of variance explained by the unique (UNIQ) contributions of each cluster. PROP STATUS is the percent of UNIQ STATUS divided by the total percent of variance explained for a given outcome in a given grade. Similarly, PROP FAM, PROP SCH, and PROP INDV are the proportions of explained variance. attributable to the unique percents of variance explained in each instance.

Four outcomes should be noted that show different patterns of change in proportions of variance explained among clusters. For self-reliance, the influence of the family authority system decreases in importance across the grades, and the influence of individual ability and success increases dramatically for twelfth graders. We can speculate that self-reliance, a developmental outcome, involves some "trade off" of dependencies so that as skills and experience in self-reliance are gained by the individual, previous reliance on the family is transferred to the self. This appears to be especially true as students approach the end of high school.

Control of environment shows an opposite pattern. The influence of the family authority cluster increases proportionately and the individual ability cluster decreases in its proportion of explained variance. Control of environment appears increasingly related to experiences with shared authority in the home environment.

Still another pattern of change in proportions is present for perceived quality of school life. Both family and individual variable

Table 5

Proportion of variance accounted for by UNIQUE STATUS, FAMILY, SCHOOL and INDIVIDUAL clusters for seven outcomes, by grade

Outcome and Grade	PROP STATUS	PROP FAM	PROP SCH	PROP INDV
Self Reliance				
6	.190	.276	.135	.217
7	.036	.321	.037	.215
9	.103	.138	.055	.186
12	.045	.105	.018	.453
Self Esteem				
6	.091	.165	.004	.424
7	.072	.099	.052	.386
9	.040	.077	.010	.520
12	.010	.236	.013	.369
Control of Environment				
6	.040	.213	.048	.374
7	.044	.257	.049	.292
9	.035	.296	.035	.251
12	.033	.369	.030	.233
Quality of School Life				
6	.005	.301	.205	.212
7	.015	.339	.185	.218
9	.011	.197	.173	.197
12	.046	.143	.401	.128
Prosocial Behavior				
6	.016	.358	.194	.124
7	.030	.267	.205	.194
9	.024	.388	.100	.167
12	.043	.331	.213	.142
Adjustment to School				
6	.055	.145	.248	.312
7	.016	.202	.311	.291
9	.044	.215	.147	.209
12	.017	.046	.356	.310
College Plans				
6	.465	.018	.017	.175
7	.284	.017	.041	.173
9	.279	.034	.014	.231
12	.283	.038	.018	.307

clusters decrease in influence across the grades, and the school environment cluster dramatically increases its proportion of explained variance for students in grade 12.

Finally, for college plans, PROP STATUS decreases initially, but maintains its position as the key family component. The cluster of individual characteristics and ability variables increases its proportionate contribution as students get closer to the point of college entry.

It will not be easy to explain the differences in patterns of change in proportions of variance explained noted for these four outcomes or anomalous patterns for other outcomes. We must be able to determine whether the variety of patterns are due to some predictable processes of socialization such as developmental processes or critical points in the adolescent experience, due to discernable differences in between-school variance on particular independent variables, or due to unmeasured or unmeasurable variables. Final analyses of changes in influence may require longitudinal data, preferably collected systematically over many years. The patterns of proportions are also of interest because of the single conclusion they support--that family and school environmental processes have a persistent, if changing, influence on nonacademic behaviors, throughout the years of adolescence.

Summary and Discussion

The interaction effects.

The tests for interactions present convincing evidence that no consistent patterns of interactions exist to suggest that different processes are at work for students from different family subgroups for the seven nonacademic outcomes studied. The grades in which statistically

TABLE 6

SUMMARY TABLE: Significant interactions and main effects for grade levels by family environmental dimension for seven outcome variables.

Outcome	Family Environmental Dimension					
	Interaction Tests [a]			Main Effects Tests		
	Participation in Family Decisions	Level of Regulation	Socio-economic Status	Participation in Family Decisions	Level of Regulation	Socio-economic Status
Personality						
Self-reliance	6	9	6	6,7,9,12	-	7,9
Self-esteem	9,12	9	12	6,7,9,12	9	-
Control of environment	7	-	-	6,7,9,12	6,9	-
School Coping Skills						
Quality of School Life	-	12	-	6,7,9,12	6,7,9	-
Prosocial School-task	-	-	7	6,7,9,12	6,7 9	-
Disciplinary Adjustment	6,12	6,7		6,7,9	7,9	-
Goal Orientation						
College plans	-	-	9	9	12	6,7,9,12

[a] Some of the significant interactions are due to family-school variable interaction and some are due to family-family variable interaction.

skills. In addition, at least a moderate level of regulation or control at home appears advantageous for school coping skills, personal adjustment and advancement. School environments that emphasize shared decision-making also tend to promote positive school attitudes, behavior, and adjustment. These results confirm the theories and extend the more limited studies of students and outcomes of shared authority at home (e.g. Baumrind, 1966, 1970; Brim and Wheeler, 1966; Bronfenbrenner, 1960; Clausen, 1968; Douvan and Adelson, 1966; Elder, 1968; Glidewell, 1966; Smith, 1968; Strodbeck 1958) and shared authority at school (e.g. Minuchin, 1969; Slaughter, 1977). The results appear to be generalizable across the middle and high school years (grades 6-12) for the white students. Contrary to some popular opinion that the influence of the family declines in late adolescence, the results of this research shows a consistent and convincing influence of family and school environments on positive student development. The findings strongly suggest that <u>throughout adolescence</u> children are influenced in important ways by what families and schools do and how they do it.

The amount and kind of student participation in decisions at home and at school affect student success in school and growth as individuals as much or more than family social class. While social class is a convenient measure that has been used often in the past as a substitute for other aspects of the family environment, and while it remains a critical control variable, it does not adequately represent the more complex conditions of family life such as the authority-control system. It is important to recognize that specific measures of family and school environments are necessary if we are to understand the processes of education and child development.

The affective outcomes considered in this research are not trivial

behaviors. Families and schools can and do influence these and similar personality, coping, and goal-oriented behaviors. This study suggests that the greatest benefit to students will be derived from home and school environments that provide opportunities for important decision-making by youngsters. Since schools appear to have far less influence than families on these behaviors, it would be appropriate for schools to consider specific models of organization that create instructional and interpersonal conditions that more closely resemble effective family environmental conditions. This may be one important way in which schools will be able to increase their influence on the development of students' positive attitudes and behavior.

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Appendix A

Measures of Independent and Dependent Variables

I. Measures of the Family Environment

1. Family decision-making style is a scale composed of the sum of scores on twelve items on the student questionnaire, which include (for example): I do not have to ask my parents for permission to do most things (True = 1), False = 0); My parents trust me to do what they expect without checking up on me (T = 1, F = 0); How much do you take part in making family decisions about yourself (Very much = 1, Much = 1, Some = 0), Very little = 0, None = 0). The reliability coefficient for this scale is .71.

2. Level of regulation is the number of behaviors from a check-list of 14 possibilities for which a student indicates that his parents have definite rules. For example, this check-list includes: Time to be in on school nights, time spent watching T.V., use of telephone, clothes you may wear, doing the dishes, doing other jobs around the house. The reliability coefficient for this scale equals .75.

3. Socioeconomic Status

A. Parents' education is the sum of the score on two student questionnaire items: "How far in school did your father go?" and "How far in school did your mother go?" The item scoring used for the seven response categories to these questions ranged from 8 for "Did not go to high school" to 18 for "Attended graduate or professional school after college." This scoring represents the approximate number of years of school completed for the particular response category.

B. Material possessions in the home is the number of items checked by an individual student from a list of 23 possessions. For example, the check list included the following: vacuum cleaner, air conditioner, electric dishwasher, dictionary, three or more magazine subscriptions, color T.V., typewriter. The reliability coefficient for this scale equals .79.

C. Family size is measured by one student questionnaire item: "How many brothers and sisters do you have?" (range 0-9).

II. Measures of the School Environment

1. The Open School Scale. This basic measure of the openness of the school environment is based on the average of student response to a 28-item index. Each of seven questions in the student questionnaire was repeated four times to refer separately to each of four academic subjects. The first of the seven questions appeared in the following form:

> Read each sentence below. Then, for each of the subjects, check the line that tells how often the statement is true for you in each subject.
>
> 1. In class, I can talk to other students while I work

	Always	Often	Sometimes	Seldom	Never
English	____	____	____	____	____
Math	____	____	____	____	____
Social Studies	____	____	____	____	____
Science	____	____	____	____	____

The remaining six questions, which also followed the same subject-specific format, were:

2. In class, I must sit next to the same students.
3. In class, I can move about the room without asking the teacher.
4. In class, the teacher stands in front of the room and works with the class as a whole.

5. When I am working on a lesson, the other students in my class are working on the same lesson.
6. Most days there are several assignments the teacher tells me I could select, and I choose the one I want to work on.
7. I could fall behind in my work without the teacher finding out about it for a couple of weeks or more.

For each of the 28 items (7 questions x 4 subjects) the percent of students who reported the program as "open" was calculated in each grade in each school. The measure of "school openness" is the average percent across the 28 items and is assigned according to the school and grade in which each individual student is enrolled. For example, a score of 25.0 for a particular school and grade means that on the average item 25 percent of the students report that their classes are usually "open" in mode of operation. Theoretically, the score on this continuum could range from 0 to 100 percent. The actual range of scores for this sample on the School Openness measure is 11.5 to 39.7 in grade 5, 10.2 to 35.3 in grade 6, 14.4 to 37.3 in grade 7, 16.5 to 53.1 in grade 9, and 17.4 to 58.1 in grade 12.

Tests were performed that show significant differences in openness of instruction at every grade level.

2. Classroom decision-making style is a scale composed of the sum of scores on ten items from the student questionnaire, which include the same items as the family-decision making scale described above but with teachers rather than parents as the referent. The reliability coefficient for this scale is .70.

III. Other Individual Background and Ability Variables

1. Sex is scored male = 1; female = 0.

2. Report card grades in math and English, reported by the student on the questionnaire, were coded A = 5, B = 4, C = 3, D = 2, and E = 1 for each subject and summed.

3. Child's verbal ability is the student score on the Cognitive Abilities Test, verbal intelligence subscale, administered by the school district.

IV. Measures of Student Development

Personality Variables

1. Self-Reliance

Scale of 18 items for the secondary school level has a reliability coefficient of .70. Items include:

	Scoring
I feel very uncomfortable if I disagree with what my friends think.	F = 1, T = 0
When the teacher tells me to keep busy on my own, I'm lost and I do not know what to do.	F = 1, T = 0
I think it will not be very hard for me to face "the cold, cruel world."	F = 0, T = 1
I just cannot say "No" when my friends call me to do something with them.	F = 1, T = 0
Even though I may not agree with my friends, I will often give in because I don't want to upset things.	F = 1, T = 0
I usually cannot get started on a writing assignment until I get some ideas from my teacher.	F = 1, T = 0

2. Self-Esteem is a four item measure with a reliability coefficient of .58. Items include:

	Scoring
I can do many things well.	T = 1, F = 0
If I could change, I would be someone different from myself.	T = 0, F = 1

3. Control of Environment is a nine item scale with a reliability coefficient of .68. Items include:

	Scoring
Luck decides most things that happen to me.	T = 0, F = 1
When I make plans, I am almost always certain that I can make them work.	T = 1, F = 0
Good luck is just as important as hard work for success.	T = 0, F = 1

School Attitudes and Coping Skills

4. Perceived Quality of School Life (short scale) is a 5-item scale with a reliability coefficient of .67. (The short scale, a version of the QSL (Epstein and McPartland 1976a) was administered to the total sample of students.) Items include:

	Scoring
I enjoy the work I do in class.	Always, Often = 1
Work in class is just busy work and a waste of time.	Seldom, Never = 1
I feel I can go to my teacher with the things that are on my mind.	Always, Often = 1

5. Prosocial School-task Behavior is a 5-item scale with a reliability coefficient of .63. Items are scored in the negative direction so that a low score indicates reports of responsible behavior. Items include:

	Scoring
If there were no report cards, I would still work just as hard in school.	T = 0, F = 1
If I knew the teacher was not going to collect my homework, I would not do my best.	T = 1, F = 0

6. Disciplinary Adjustment is a nine-item weighted scale with a reliability of .77. Items include:

	Scoring
During this school year have you ever been suspended from school?	Yes = 0, No = 3
During this school year were you ever sent to the office for getting into trouble?	Several times = 0 Once or twice = 2 Never = 3
During this school year were you ever scolded in class for fooling around (and 6 other infractions).	Several times = 0 Once or twice = 2 Never = 3

Goal Orientations

7. College Plans is a single item indicator of plans to attend college "as a full-time student right after high school."